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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,375	08/31/2007	Neil Anthony Tivey	9052-240	9083
20792	7590	11/23/2011	EXAMINER	
MYERS BIGEL, SIBLEY & SAJOVEC			LAZORCIK, JASON L	
PO BOX 37428			ART UNIT	PAPER NUMBER
RALEIGH, NC 27627			1741	
MAIL DATE		DELIVERY MODE		
11/23/2011		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>		<b>Application No.</b>	<b>Applicant(s)</b>
		10/575,375	TIVEY ET AL.
<b>Examiner</b>		<b>Art Unit</b>	
JASON L. LAZORCIK		1741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 September 2011.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 5) Claim(s) 1-19, 22 and 23 is/are pending in the application.
- 5a) Of the above claim(s) 1-7 and 15-19 is/are withdrawn from consideration.
- 6) Claim(s) \_\_\_\_\_ is/are allowed.
- 7) Claim(s) 8-14 and 22-23 is/are rejected.
- 8) Claim(s) \_\_\_\_\_ is/are objected to.
- 9) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/GB-06)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

**DETAILED ACTION**

**State of the Claims**

Applicants reply dated August 2, 2011 adds new claims 22-23. All other claims stand as previously presented in the reply dated December 22, 2010.

Claims 1-23 have been presented in the application. Claims 20-21 have been cancelled by Applicant and claims 1-7 and 15-19 have been withdrawn from consideration with traverse pursuant to the restriction election requirement dated June 28, 2010 and Applicants response thereto dated December 22, 2010. In view of the foregoing, claims 8-14 and 22-23 are pending for prosecution on the merits.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

**Claims 8, 9, 10, and 13 are rejected under 35 U.S.C. 102(a) as being anticipated by Uchida (WO 2004/004420 - Published January 8, 2004; Please note specific citations to the instant reference are made with respect to the United States Patent equivalent document US 7,202,451).**

With respect to claim 8, Uchida teaches (see figure 10, col. 1, lines 54-65) an apparatus capable of melting glass via induction melting which comprises a current conducting melting vessel (40) made from, for example, carbon and comprising at least two induction heating coils provided proximate to the melting vessel (48a, 48b). With particular reference to figure 1 (col. 7, line 57-col. 8, line 31), a plurality of power supply circuits (110m, 110s) are respectively associated with one of the heating coils (152m, 152s). Each power supply comprises a switching circuit (114, 120) which is arranged in such manner to prevent mutual induction of current in a respective coil when an adjacent coil is energized (col. 5, lines 53-67).

Regarding claim 9, see figures 10 and 1.

Regarding claim 10, see element (114) in figure 1 and col. 7, lines 59-60.

Regarding Claim 13, see condensers (154m, 154s). Said condensers are charged by the power control circuit depending on the state of the switching element

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Apple (US 3,244,495) in view of Uchida (WO 2004/004420) as applied to claim 8 above.**

Apple teaches an induction heating furnace comprising an inlet (12), outlet (17) attached to vessel (13). Apple teaches that each of the vessel, inlet and outlet are heated via respective heating units.

Although Apple does not explicitly teach the presence of a drain outlet as presently claimed, such a modification would have been construed as an obvious extension over the Apple disclosed structure for one of ordinary skill in the art at the time of the invention seeking to facilitate periodic shutdown of the furnace.

Apple teaches use of an induction coil (21) to heat vessel (13) and associated AC circuit to control the induction coil. Apple further teaches separate heating means and heater controlling means for each of the inlet (12) and outlet (17). Apple teaches that provision of heating means at the inlet and outlet and main body allow precise control of the viscosity of the glass at a particular area of the furnace and that such

control over the viscosity allows control over the rate of glass flow through the inlet and outlet of the furnace.

Apple is silent regarding the nature of the inlet or outlet heating means.

As noted above, Uchida teaches every aspect of Applicants induction melting furnace comprising plural adjacent induction coils for selectively heating a respective region of the melt furnace and further comprising switching elements associated with each coil and arranged to prevent mutual induction between adjacent coils.

In view of the prior art of record, one of ordinary skill in the art would have found it obvious to employ the Uchida induction coil heater arrangement for each of the Apple inlet, outlet and main vessel induction coil heaters. Specifically, Uchida demonstrates that the disclosed system provides effective control over the temperature distribution within an induction furnace which is similar to that disclosed in the Apple reference. Further Uchida teaches that the disclosed induction heating coil arrangement beneficially prevents mutual induction of current in adjacent inductor coils.

**Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida (WO 2004/004420) as applied to claim 8 above, and further in view of Simcock (US 5,349,167)**

As noted above, Uchida teaches every aspect of Applicants induction melting furnace comprising plural adjacent induction coils for selectively heating a respective region of the melt furnace and further comprising switching elements associated with each coil and arranged to prevent mutual induction between adjacent coils.

Uchida is silent regarding the operating frequency of the power supply.

In a closely related body of work, Simcock teaches a rectifier inverter power supply for use in powering the induction coil of an induction heating or melting apparatus with multiple zone heating control. Of particular relevance, Simcock teaches that the circuit operates to provide a frequency from approximately 50 Hz to approximately 10 kHz of pulsed power to the coil.

In view of Simcock, one having no more than a routine level of skill in the art at the time of the invention would have been fully equipped to select an appropriate operating frequency of the Uchida induction heating power supply. Further, a skilled technician would have reasonably derived a circuit capable of operating within the claimed operating frequency of 50 Hz through no more than routine experimentation and optimization of the prior art disclosed device.

**Claims 8, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fishman (US 6,121, 592).**

Fishman discloses a current conducting melting vessel (60), a plurality of induction heating coils provided at locations proximate to the melting vessel (see figure 3, elements 91, 92, and 93), and a plurality of power supply circuits each of which comprises a switching element (33, 34, 35) which may be employed to isolate and provide power to each respective section of the coil (col. 6, line 51-col. 7, line11).

Although the Fishman reference does not explicitly state that mutually induced currents may be prevented/permited between adjacent coil sections according to the on or off status of the respective switching elements (33, 34, or 35), it is the Examiners assessment that switching the appropriate thyristors located at the terminals of a given coil to an "off" state would be expected to prevent current from flowing through said coil. Further, it is noted that the instant references teaches the use of antiparallel SCRs (e.g. thyristors) employed in the power supply circuit for each coil (33, 34, and 35) and provided in an arrangement which parallels the arrangements of the first (81) and second (84) switching elements of the instant application. Where the Specification of the instant application attributes this thyristor arrangement of the first switching element (81) with the prevention of mutual inductance in adjacent coils (see paragraph [0056]), it is the Examiners assessment, absent compelling evidence to the contrary, that the Fishman device would similarly prevent a mutually induced current in their adjacent inductance coils even though such a behavior is not expressly discussed in either reference.

Regarding newly presented claims 22 and 23, see discussion of claim 8 above.

***Response to Arguments***

Applicant's arguments filed August 2, 2011 have been fully considered but they are not persuasive.

With respect to the rejection of 8-14 in view of Uchida, Applicant asserts that Uchida fails to disclose the claimed switching element because in the prior art device "mutual induction is apparently always permitted regardless of the switch". Applicant thereby concludes that Uchida does not "disclose a switching element arranged to prevent or permit mutual induction of current".

In response, Applicant is respectfully advised that the contested limitation, namely wherein "each power supply circuit includes a switching element arranged to prevent or permit a mutual induction of current in a respective heating coil when an adjacent heating coil is energized", is set forth in alternative language. As such, the claim is reasonably construed to encompass circuits comprising switching elements which (A) prevent mutual inductance between adjacent coils or which (B) permit mutual inductance between adjacent coils or which (C) serve to both prevent and permit mutual inductance between adjacent coils. In view of the foregoing and in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., wherein the power supply circuit comprises switching elements which both prevent and permit mutual inductance between adjacent coils depending upon the on/off state of each

switch) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further, to the extent that Applicant alleges that the Uchida circuit necessarily always permits mutual induction of current between adjacent coils, Applicant is respectfully advised that no evidence has been made of record to support such an allegation. Further, Uchida explicitly and repeatedly discloses that the circuit may be configured to maintain a desired phase difference and drive current between each adjacent coil (see col. 3, lines 29-48; col. 3, lines 56-59; col. 5, line 53-67; col. 17, lines 44-47; col. 18, line 18-31). Applicant will appreciate that the magnetic flux between two adjacent coils with the same number of turns may be cancelled by when the coils are driven at power but 180° out of phase with each other. Where the prior art circuit is adjustable in each of the power delivered to each coil as well as the output phase of the drive voltage, it follows absent compelling evidence to the contrary that the circuit could be driven in such a manner as to prevent mutual induction of current between adjacent coils.

Insofar as Applicant alleges that the Uchida circuit is incapable of operating in accordance with the claimed invention and since Applicant has provided no conclusive evidence in support of the instant allegations, it follows that said allegations are held to be mere conjecture and attorney argument.

The Official policy regarding Attorney argument is clearly outlined in MPEP

§2145 [R-3]:

"Attorney argument is not evidence unless it is an admission, in which case, an examiner may use the admission in making a rejection. See MPEP § 2129 and § 2144.03 for a discussion of admissions as prior art. The arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997) ("An assertion of what seems to follow from common experience is just attorney argument and not the kind of factual evidence that is required to rebut a prima facie case of obviousness."). See MPEP § 716.01(c) for examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON L. LAZORCIK whose telephone number is (571)272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/JASON L LAZORCIK/  
Primary Examiner, Art Unit 1741